

## 2021 NIST/UL Workshop on Photovoltaic Materials Durability (Agenda)

December 7-9, 2021

9:00 AM-12:15 PM (UTC-05:00)

Virtual Meeting

Day 1: Tuesday, December 7, 2021 (9:00 AM-12:15 PM, UTC-5:00)	
8:30 - 9:00 AM	Speakers and Session Chairs Check In ( <b>Xiaohong Gu, NIST</b> )
9:00 - 9:15 AM	Opening Remarks--- <b>Joannie Chin, Acting Director, NIST Engineering Laboratory</b> <b>Kenneth Boyce, Director, UL Energy &amp; Power Technologies</b>
<b>Session 1: PV Reliability Programs (Chairs: Kenneth Boyce, UL and Laura Schelhas, NREL)</b>	
9:15 - 9:30 AM	DOE SETO Office ( <b>Garrett Nilsen, DOE</b> )
9:30 - 9:45 AM	DuraMAT: Material Durability Research Enabling 50-year Modules ( <b>Teresa Barnes, NREL</b> )
9:45 - 10:00 AM	IEA-PVPS Task 13: Quality, Durability and Integration of PV in Different Environments & Applications ( <b>Ulrike Jahn, VDE Renewable GmbH, Germany</b> )
10:00 - 10:15 AM	Panel Discussion (Chairs: Kenneth Boyce and Laura Schelhas)
<b>Session 2: PV Module Circular Economy (Chairs: Aron Newman, NIST and Tadanori Tanahashi, AIST)</b>	
10:15 - 10:30 AM	PV Circular Economy: Regulatory and Policy Considerations ( <b>Taylor Curtis, NREL</b> )
10:30 - 10:45 AM	Approaches to Facilitate Responsible PV Module Re-Use ( <b>François Rummens, Belgian Electrotechnical Committee, Belgium</b> )
10:45 - 11:00 AM	Increasing the Recyclability of PV Modules ( <b>Gernot Oreski, PCCL, Austria</b> )
11:00 - 11:15 AM	Panel Discussion (Chairs: Aron Newman and Tadanori Tanahashi)
<b>Session 3: Climate Change and Post-disaster Investigation (Chairs: Nancy Phillips and Robert Flottemesch, Brookfield USA)</b>	
11:15 - 11:30 AM	Field Failures and Extreme Weather: Findings from Field-testing of Damaged Solar Assets ( <b>Jenya Meydbray, PV Evolution Labs, Canada</b> )
11:30 - 11:45 AM	Bolted Joint Research - Improving the Resilience of PV Systems ( <b>Gerald Robinson, Lawrence Berkeley National Laboratory</b> )
11:45 AM - 12:00 PM	Identifying and Characterizing Fire Related Damage in Solar Modules ( <b>Eric Daniels, Suncycle USA</b> )
12:00 PM - 12:15 PM	Panel Discussion (Chairs: Nancy Phillips and Robert Flottemesch)

**Day 2: Wednesday, December 8, 2021 (9:00 AM-12:15 PM, UTC-5:00)**

8:30 - 9:00 AM Speakers and Session Chairs Check In (**Xiaohong Gu, NIST**)

**Session 4: PV Module Field Performance (Chairs: Peter Pasmans, Endurans Solar and Colleen O'Brian, UL)**

9:00 - 9:15 AM Testing Methodology, Measurement, and Observation Biases: Insights from 80GW of PV field inspections (**Rob Andrews, Heliolytics**)

9:15 - 9:30 AM Real-World Backsheet Survey (**Laura Bruckman, Case Western Reserve University**)

9:30 - 9:45 AM Electrical Insulation for Field Aged Modules (**Tadanori Tanahashi, AIST, Japan**)

9:45 - 10:00 AM Panel Discussion (Chairs: Peter Pasmans and Colleen O'Brian)

**Session 5: Accelerated Laboratory Testing (Chairs: Michael Owen-Bellini, NREL and TBD)**

10:00 - 10:15 AM Rate of PID-p Progression in n-PERT Cells Depends on Encapsulant Resistivity and Irradiance (**Brian Habersberger, Dow**)

10:15 - 10:30 AM New Approaches to Accelerated Stress Testing of Polymer Backsheets to Understand Photo- and Thermomechanical Degradation (**Kaushik Roy Choudhury, DuPont**)

10:30 - 10:45 AM BACKFLIP: A Comparison of Emerging Non-Fluoropolymer-Based, Co-Extruded PV Backsheets to Industry-Benchmark Technologies (**David Miller, NREL**)

10:45 - 11:00 AM Validating IEC TS 63209 Mechanical and Backsheet Degradation Test Legs (**Colin Sillerud, CFV LABS**)

11:00 - 11:15 AM Panel Discussion (Chairs: Michael Owen-Bellini and TBD)

**Session 6: Linking Accelerated Laboratory Tests to Field Performance (Chairs: William Gambogi, Xiaohong Gu, NIST)**

11:15 - 11:30 AM Understanding the Variability Extrapolation from Lab to Field Conditions (**Mike Kempe, NREL**)

11:30 - 11:45 AM Challenges, Opportunities and Approaches for New Service Life Estimation Models for PV Modules- Results of IEA-PVPS-Task 13 (**Karl-Anders Weiss, Fraunhofer ISE, Germany**)

11:45 AM - 12:00 PM Moving from Qualifying Test to Service Life Prediction (**James Pickett, Consultant**)

12:00 PM - 12:15 PM Panel Discussion (Chairs: William Gambogi and Xiaohong Gu)

Day 3: Thursday, December 9, 2021 (9:00 AM-12:15 PM, UTC-5:00)	
8:30 - 9:00 AM	Speakers and Session Chairs Check In ( <b>Xiaohong Gu, NIST</b> )
<b>Session 7: Characterization and Modeling (Chairs: David Miller, NREL and Mihail Bora, LLNL)</b>	
9:00- 9:15 AM	Material Characterization and Durability of Clear Backsheets for Bifacial PV Modules ( <b>Xiaohong Gu, NIST</b> )
9:15 - 9:30 AM	Measurement and Simulation of Moisture in PV Modules ( <b>Stefan Mitterhofer, NIST</b> )
9:30 - 9:45 AM	Predicting Performance of PV Modules with Differing UV Absorbers Undergoing UV-Induced Degradation ( <b>Peter Hacke, NREL</b> )
9:45 - 10:00 AM	Panel Discussion (Chairs: David Miller and Mihail Bora)
<b>Session 8: Linking Research to Standards (Chairs: George Kelly, IEC and Liang Ji, UL)</b>	
10:00 - 10:15 AM	Role of Extended Testing of PV Components and Backsheet Testing in IEC Standards ( <b>Nancy Phillips</b> )
10:15 - 10:30 AM	Development of the Front- and Back-sheet Standard (IEC 62788-2-1) ( <b>Peter Pasmans, Endurans Solar, The Netherlands</b> )
10:30 - 10:45 AM	UL Standards Update: Corrosion Testing for PV Applications ( <b>Colleen O'Brian, UL</b> )
10:45 - 11:00 AM	Panel Discussion (Chairs: George Kelly and Liang Ji)
<b>Session 9: Emerging PV Technology (Chairs: Ingrid Repins, NREL and Stephanie Moffitt, NIST)</b>	
11:00 - 11:15 AM	Perovskite Module Scaling and Stability ( <b>Reinhold Dauskardt, Stanford University</b> )
11:15 - 11:30 AM	Photovoltaics for Vehicles -Similarities and Differences between Standard PV and Car-Component PV ( <b>Kenji Araki, University of Miyazaki, Japan</b> )
11:30 - 11:45 AM	Performance Risks for Building Integrated Photovoltaic Materials, Modules, and Systems ( <b>Andrew Fairbrother, EPFL, Switzerland</b> )
11:45 AM -12:00 PM	Panel Discussion (Chairs: Stephanie Moffitt and Ingrid Repins)
12:00 PM -12:15 PM	<b>Summary and Adjourn (Kenneth Boyce, UL &amp; Xiaohong Gu, NIST)</b>

***Past NIST PV Workshops can be found:***

[\*2019 NIST/UL Workshop on PV Materials Durability\*](#)

[\*2017 4<sup>th</sup> NIST/Atlas Workshop on PV Materials Durability\*](#)

[\*2015 3<sup>rd</sup> NIST/Atlas Workshop on PV Materials Durability\*](#)

[\*2013 2<sup>nd</sup> NIST/Atlas Workshop on PV Materials Durability\*](#)

[\*2011 1<sup>st</sup> NIST/Atlas Workshop on PV Materials Durability\*](#)